a heater/thermometer pattern disposed on said microthin film membrane.

134. (Amended) The apparatus of claim 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 or 124, wherein said microthin film membrane forming said at least one sensor is a silicon nitride membrane, and wherein said substrate supporting said silicon nitride membranes in said sensor array is a silicon wafer.

135. (Amended) The apparatus of claim 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 or 124, wherein said substrate is made of a polymer sheet, and wherein said sensor array includes a plurality of heaters/thermometers disposed on said polymer sheet.

138. (Amended) The apparatus of claim 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 or 124, wherein said substrate is made of a poor thermal conducting material that is at least 100 microns thick, and wherein said sensor array includes a plurality of heaters/thermometers disposed on said poor thermal conducting material.

140. (Amended) The apparatus of claim 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 or 124, wherein said substrate is made of a polymer sheet.

141. (Amended) The apparatus of claim 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 or 124, wherein said substrate is made from a material having poor thermal conductivity and is placed on a heater block, and wherein said sensor array includes a plurality of temperature sensors disposed on the substrate such that a temperature difference between a first portion and a second portion of the substrate can be determined.

143. (Amended) The apparatus of claim 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 or 124, wherein the at least one thermal property characterized by said sensor array is a complex dielectric constant.